STIC Search Results
Feedback Form

EIC 2800

Questions about the scope or the results of the search? Contact *the EIC searcher or contact*:

Jeff Harrison, EIC 2800 Team Leader
571-272-2511, JEF 4B68

Voluntary Results Feedback Form

➢ *I am an examiner in Workgroup:* [   ]   *Example: 2810*

➢ *Relevant prior art **found**, search results used as follows:*

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

➢ *Relevant prior art **not found**:*

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC2800, CP4-9C18

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AN   2001:722315 HCAPLUS Full-text
DN   136:13848
TI   Mechanisms of inert gas impact induced interlayer mixing in metal
      multilayers grown by sputter deposition
AU   Zhou, X. W.; Wadley, H. N. G.
CS   Intelligent Processing of Materials Laboratory, Department of Materials
      Science and Engineering, School of Engineering and Applied Science,
      University of Virginia, Charlottesville, VA, 22903, USA
SO   Journal of Applied Physics (2001), 90(7), 3359-3366
      CODEN: JAPIAU; ISSN: 0021-8979
PB   American Institute of Physics
AB   Control of interfacial roughness and chemical mixing is critical in
      nanomaterials. For example, multilayers composed of .apprx.20 Å conductive layer
      sandwiched between two .apprx.50 Å ferromagnetic layers can exhibit giant
      magnetoresistance (GMR). This property has caused a tremendous recent increase
      in hard disk storage capacity, and can potentially result in a new generation of
      nonvolatile **magnetic random access** memories. Good GMR properties can be obtained
      when the interfacial roughness and interlayer mixing of these multilayers are
      low. However, **flat** interfaces in nanoscale multilayers are not thermodynamically
      stable, and cannot be obtained using thermal energy deposition processes such as
      MBE. Hyperthermal energy sputter deposition techniques using either plasma or
      ion-beam gun are able to create nonequil. **flat** interfaces, and produce better GMR
      multilayers. In these processes, however, inert gas ions or neutrals with
      energies between 50 and 200 eV can impact the growth surface. This may be a
      major source for interlayer mixing. By using a mol. dynamics technique and a
      reduced order model, the composition profile across the thickness of multiply
      repeated Ni/Cu/Ni multilayers was calculated as a function of the energy and the
      relative flux of the inert gas ions or neutrals as well as the layer thickness.
      The results indicate that the 50-200 eV inert gas impact caused atomic exchange
      between adjacent atomic layers near the surface. The probability of exchange
      increased with **impact energy,** but decreased with the number of overlayers. The
      exchange between Ni **overlayer** and Cu underlayer atoms was much more significant
      than that between Cu overlayer and Ni underlayer atoms. As a result, the Ni on
      Cu interfaces were much more diffuse than the Cu on Ni interfaces, in good
      agreement with expts. At very high inert gas flux and impact energy, an increased
      probability for the underlying Cu atoms to be exchanged to the surface resulted
      in significant Cu surface segregation.
CC   76-12 (Electric Phenomena)
      Section cross-reference(s): 56, 66

AN   2001:326797   HCAPLUS   Full-text
DN   135:69844
TI   Two-dimensional topological solitons in rectangular magnetic dots
AU   Metlov, Konstantin
CS   Institute Physics ASCR, Prague, CZ-18221, Czech Rep.
SO   Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2001)
      1-3, arXiv:cond-mat/0105072, 3 May 2001
      CODEN: LNCMFR
      URL: http://xxx.lanl.gov/pdf/cond-mat/0105072
PB   Los Alamos National Laboratory
AB   A general approach allowing to find the anal. expressions for equilibrium
      magnetic structures in small and **flat** magnetic nano-sized cylinders of arbitrary
      shape made of soft magnetic material is presented. The resulting magnetization
      distributions are two-dimensional topol. solitons and have a nonzero topol.
      charge. The approach is illustrated here on an example of a thin rectangular
      particle.
CC   77-1 (Magnetic Phenomena)
IT   Distribution function
      Magnetization
        Memory devices
      Quantum dot devices
      Solitons
          (**magnetization** distribution and two-dimensional topol.
          solitons in rectangular **magnetic** dots)

AN   1999:601791 HCAPLUS Full-text
DN   131:316220
TI   Epitaxial growth of atomically **flat spin
      dependent tunneling** junctions
AU   Li, Y.; Wang, S. X.; Mancoff, F. B.; Clemens, B. M.
CS   Department of Material Science and Engineering, Stanford University,
      Stanford, CA, 94305, USA
SO   Materials Research Society Symposium Proceedings (1999), 570(Epitaxial
      Growth--Principles and Applications), 73-78
      CODEN: MRSPDH; ISSN: 0272-9172
PB   Materials Research Society

AB   **Spin dependent tunneling** junctions with epitaxially grown underlayers were
      studied to examine the possibility of achieving very **flat** and uniform barrier
      layers. Pt/Ni80Fe20/Fe50Mn50/Ni80Fe20 layers were deposited on sapphire (0001)
      substrates at different temps. and monitored by in-situ RHEED. The surface
      morphol. depends strongly on the growth temperature X-ray diffraction and
      magnetic hysteresis loop measurements were also performed to characterize the
      film structures.
CC   76-2 (Electric Phenomena)
      Section cross-reference(s): 75, 77
IT   Sputtering
          (epitaxy; sputter epitaxy of atomically **flat spin
          dependent tunneling** junctions)
IT   Magnetic hysteresis
      Surface reconstruction
      Surface structure
          (from sputter epitaxy of atomically **flat spin
          dependent tunneling** junctions)
IT   Tunnel junctions
          (sputter epitaxy of atomically **flat spin
          dependent tunneling** junctions)
IT   Epitaxy
          (sputter; sputter epitaxy of atomically **flat spin
          dependent tunneling** junctions)
IT   Temperature
          (substrate; in sputter epitaxy of atomically **flat
          spin dependent tunneling** junctions)
IT   7440-06-4, Platinum, processes   11148-13-3, Iron 20, nickel 80 (atomic)
      51403-40-8, Iron 50, manganese 50 (atomic)
      RL: PEP (Physical, engineering or chemical process); TEM (Technical or
      engineered material use); PROC (Process); USES (Uses)
          (sputter epitaxy of atomically **flat spin
          dependent tunneling** junctions from)
IT   1344-28-1, Aluminum oxide (Al2O3), processes
      RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical
      process); PROC (Process); USES (Uses)
          (substrate; in sputter epitaxy of atomically **flat
          spin dependent tunneling** junctions)

AB   The **Spin-dependent tunneling**
      magnetoresistance (TMR) effect was observed in NiFe/Al2O3/Co thin films. The
      samples were prepared by magnetron sputtering in a system with a base pressure of
      3+10-6 Torr. The insulating Al2O3 layer was prepared by r.f. plasma oxydation
      method of a metallic Al layer. The ferromagnetic and insulating layers were
      deposited through metallic masks to produce the cross pattern form. The junction
      has an active area of 0.3+0.3mm2 and the Al2O3 layer is deposited through a
      circular mask with a diameter of 1 mm. It is very important that insulating
      layer is formed very thinly and uniformly in tunneling junction. The
      ferromagnetic layer was fabricated in optimum conditions and the surface of that
      was very **flat,** which was observed by AFM. Tunneling junction was confirmed
      through nonlinear I-V curve. NiFe/Al2O3/Co junction was observed for
      magnetization behavior and magnetoresistance property and magnetoresistance
      property is dependent on magnetization behavior of two ferromagnetic layers. The
      maximum magnetoresistance ratio was about 6.5%.
CC   76-2 (Electric Phenomena)

AN   1991:477044   HCAPLUS Full-text
DN   115:77044
TI   Effect of the production process on silicon nitride film characteristics
AU   Kirino, Fumiyoshi; Mutou, Akiko; Ohta, Norio
CS   Cent. Res. Lab., Hitachi, Ltd., Kokubunji, Japan
SO   Nippon Kinzoku Gakkaishi (1991), 55(6), 706-14
      CODEN: NIKGAV; ISSN: 0021-4876

AB   SiNx films are widely used as protection and Kerr enhancement films for
      magnetooptical disks. The characteristics of SiNx films produced by reaction
      sputtering using a Si target were studied by FTIR, Auger electron spectroscopy, a
      microscope, an x-ray diffraction meter, and the ESCA method. The film, produced
      by a pass-by-type sputtering apparatus, a low sputtering gas pressure, and a
      short length between the target and the substrate, did not contain O. The
      reaction sputtering method had little effect on the sputtering condition. O was
      not contained in the film using this production condition. The magnetooptical
      recording film was corroded if the SiNx film containing O was used as Kerr
      enhancement and protection film. N possessed 1 bonding order, independent of the
      production process, while the Si bonding order was process dependent. The
      surface of the film was **flat** and amorphous. A magnetooptical disk using the SiNx
      films had no problems such as an increased noise level.
CC   57-2 (Ceramics)
IT   **Memory devices**
          (**magnetic,** optical, silicon nitride sputtered films for,
          processing property relations of)

AN   1991:212432 HCAPLUS <u>Full-text</u>
DN   114:212432
TI   New glass substrate
AU   Nagarekawa, Osamu
CS   HOYA Corp., Hachioji, Japan
SO   Kagaku Kogyo (1990), 41(8), 698-706
      CODEN: KAKOAY; ISSN: 0451-2014
AB   A review, with 10 refs., of phys., chemical, structural, and elec.
      characteristics of glass substrates for photomask, **flat** display panel, and
      magnetic and magnetooptical memory disk applications.
CC   57-0 (Ceramics)
      Section cross-reference(s): 74, 76, 77
IT   **Memory devices**
          (**magnetic** or **magnetooptical** disks, glass substrates
          for)
IT   Glass, oxide
      RL: USES (Uses)
          (substrates, for photomask and **flat** display panel and
          magnetic and magnetooptical memory disk)

AN   1991:194753   HCAPLUS   Full-text
DN   114:194753
TI   The dependence of the corrosion behavior of rigid magnetic memory disks on
      the deposition conditions of the underlayer, magnetic layer, and carbon
      overcoat
AU   Sides, Paul J.
CS   Dep. Chem. Eng., Carnegie Mellon Univ., Pittsburgh, PA, 15213, USA
SO   Proceedings - Electrochemical Society (1991), 91-2(Proc. Int. Symp.
      Corros. Electron. Mater. Devices, 1st, 1990), 135-51
      CODEN: PESODO; ISSN: 0161-6374
AB   The electrochem. response of rigid disk samples prepared by d.c. magnetron
      sputtering and immersed in 3 weight% KCl aqueous solution was investigated. Most
      of the disk samples had the formulation /C/CoNi/NiP/Cr/AlMg; the others had no
      carbon overcoat. The Ar pressure and sputtering power during sample preparation
      were varied between 5 and 15 mtorr and between .5 and 1.5 kW, resp. Electrochem.
      impedance anal. and linear sweep voltammetry yielded values for the double layer
      capacitance and the faradaic resistance that characterize the ability of the
      films to resist corrosion. The chromium underlayer affected the corrosion
      properties of the films most strongly; an Ar pressure of 5 mtorr and RF power of
      1.5 kW for the Cr deposition yielded corrosion-resistant films, but values of 15
      mtorr and 0.5 kW yielded easily corroded films (deposition conditions of the
      other layers being held constant). The corrosion-resistant films were **flat** and
      relatively featureless and the crystalline quality of the magnetic layer was
      good. The films susceptible to corrosion were rough with sharp edges and
      possible microgaps in the carbon layer while the magnetic layer had poor
      crystalline quality.
CC   72-6 (Electrochemistry)
      Section cross-reference(s): 56, 76, 77
IT   **Memory devices**
          (**magnetic**, disks, corrosion of, in potassium chloride solution,
          effect of **underlayer** and **magnetic** layer and carbon overcoat
          on)

AN   1983:604945 HCAPLUS Full-text
DN   99:204945
TI   Preparation of magnetic bubble garnet film
PA   Hitachi, Ltd., Japan
SO   Jpn. Kokai Tokkyo Koho, 2 pp.
       CODEN: JKXXAF

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 58127310	A2	19830729	JP 1982-8947	19820125
PRAI JP 1982-8947		19820125		

AB   A bubble-domain ferrite garnet film for memory devices without magnetic defects
       and high adherence to a photomask during processing is produced by smoothing the
       film surface after epitaxy by a high-power laser irradiation Thus, a
       $(Y,Sm,Lu,Ca)(Fe,Ge)_5O_{12}$ film was epitaxially grown on a $Gd_3Ga_5O_{12}$ substrate and
       irradiated with a pulsed (10 ns) laser beam of intensity 2 + 108 W/cm2 to give a
       flat film for bubble memory devices.
IC   H01F041-28; G11C011-14; G11C019-08
CC   77-3 (Magnetic Phenomena)
IT   **Memory devices**
          (**magnetic** bubble, laser smoothing of ferrite garnet films
          for)

AN   1979:621469 HCAPLUS <u>Full-text</u>
DN   91:221469
TI   Study of a chemical method of making low-coercivity channels for
      propagation of **flat** magnetic domains
AU   Vasilieva, N. P.; Maliutin, V. Yu.; Kulicov, Yu. S.; Gal, Felix A.
CS   Inst. Control Sci., Moscow, USSR
SO   IEEE Transactions on Magnetics (1979), MAG-15(5), 1339-42
      CODEN: IEMGAQ; ISSN: 0018-9464

AB   Static magnetic characteristics and film surface structure were studied in
      relation to a chemical method of producing a hard magnetic layer around low
      coercivity channels. Applicability of the channels obtained was studied from the
      viewpoint of their ability to provide functionally stable propagation of **flat**
      magnetic domains. Probability of a false domain occurrence in propagation steps
      strongly depends upon the coercivity of the hard magnetic layer, magnetic
      properties, and **shape** of the low-coercivity channels and the parameters of the
      control fields, and may be well described by the exponential law in the area of
      small values for one transfer cycle per one bit (P1/1). Certain types of
      channels with certain values of hard magnetic layer coercivity and domain
      nucleation field have an area in which the value of the required erase field is
      practically independent of the propagation field. The study and computations show
      that the chemical method is capable of providing sufficiently low values of P1/1.
      The mechanism of false domain occurrence was not studied.
CC   77-1 (Magnetic Phenomena)
IT   **Memory devices**
         (**magnetic flat** domain propagation in films for,
         etching of low-coercivity channels for)
IT   Magnetic domain
         (propagation of **flat,** etching of low-coercivity channels for,
         in cobalt-iron-nickel alloy films)
IT   12647-03-9
      RL: PRP (Properties)
         (magnetic **flat** domain propagation in memory films of,
         low-coercivity channel etching for)

AN   1975:10083 HCAPLUS <u>Full-text</u>
DN   82:10083
TI   Liquid/solid interface profile of melt grown oxide crystals. I.
        Czochralski growth
AU   Perner, B.; Kvapil, J.; Kvapil, Jos.
CS   Turnov, Czech.
SO   Czechoslovak Journal of Physics (1974), 24(10), 1091-6
        CODEN: CZYPAO; ISSN: 0011-4626
AB   The relation between temperature gradient and the liquid/solid interface profile
        of Czochralski grown Al_2O_3 and Y Al garnet crystals is described. Lowering the
        radial component as well as increasing the axial component of temperature
        gradient during crystal growth causes the convex or pointed interface to be
        flattened. In the range of magnitudes for both of the components of temperature
        gradient used, 4 types of interface profiles were found. An alteration of the
        interface profile which causes local increase of the growth rate can be
        accompanied by cell formation. The volume of the portion of the growing crystal
        submerged in the melt is directly proportional to the optical transmissivity of
        the crystal and inversely proportional to the optical transmissivity of the melt.
CC   75-1 (Crystallization and Crystal Structure)
IT   **Memory devices**
            (**magnetic,** rare earth garnet crystals for, growth of)

AN   1966:434974 HCAPLUS Full-text
DN   65:34974
OREF   65:6491g-h,6492a
TI   Demagnetizing and stray fields of elliptical films
AU   Chang, H.; Burns, J.
CS   Intern. Business Machine Watson Res. Center, Yorktown Heights, NY
SO   Journal of Applied Physics (1966), 37(8), 3240-5
       CODEN: JAPIAU; ISSN: 0021-8979

AB   The magnetostatic fields inside and outside of a ferromagnetic thin film, called
       demagnetizing and stray fields, resp., are known to be calculable from the model
       of a uniformly magnetized **flat** ellipsoid. These fields are plotted as functions
       of the spatial coordinates with the aspect ratios b/a and c/a as parameters. The
       information is applied to a number of magnetic thin-film device and physics
       problems. Demagnetizing fields influence wall motion threshold, **shape**
       anisotropy, and the stability of domain configuration. Stray fields affect the
       creeping and switching thresholds of memory elements in an array. The
       effectiveness of demagnetizing field reduction in a film pair dictates the drive
       line configuration. In films coupled magnetostatically or by exchange force, the
       planar components of stray field are important in determining both the
       quasistatic and dynamic magnetization reversals. However, the normal component
       of stray field, being much smaller than the normal component of demagnetizing
       field, has no significant effect on switching.
CC   9 (Electric and Magnetic Phenomena)
IT   **Memory devices**
         (from **magnetic** (ferro-) films, creeping and switching
         thresholds of, effect of stray fields on)

AN   1965:421307   HCAPLUS Full-text
DN   63:21307
OREF   63:3757e-g
TI   Thin conductive supports for magnetic memory elements
PA   Sperry Rand Corp.
SO   4 pp.

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	GB 992368		19650519	GB		<--
	NL 297713			NL		
PRAI	US		19620910	<--		

AB   Uniformly smooth **flat** supports for magnetic Ni-Fe films sufficiently thin for
       close positioning of the driving current loop to the storage film in memory
       devices, are formed by vapor or chemical deposition of a conductive metal film on
       a polished **flat** glass surface, thickening the film to 5-10 mils by electrolysis,
       and stripping the deposit from the glass for application of the magnetic Ni-Fe
       layer on the surface smoothed by the glass contact. Oxidation of that surface
       must be carefully prevented, and can be assured by making the 1st layer on the
       glass of Ag, Pd, Au, or Cr. A glass surface was cleaned and polished with a
       thick $CaCO_3$ paste for this purpose, and mildly sandblasted around the edges of
       the area to receive the metallic deposit. A sensitizing solution containing 70
       g./l. $SnCl_2.2H_2O$ and 40 ml. concentrated HCl was applied 4 min. at room
       temperature and followed by 4 min. activation in a solution containing 0.1 g./l.
       $PdCl_2.2H_2O$ and 1 ml./l. HCl at 110°F. and 3.5-4.5 pH. Cu was then deposited by 4
       min. immersion in a solution of $CuSO_4$ 66.5, K_2SO_4 8, NaK tartrate 336.8, NaOH
       94.5 g./gal. and 37% formaldehyde 25 ml./gal. at 90°F. The Cu deposit was
       thickened electrolytically in a sulfate bath at 30 amp./ft.2 c.d. to 10 mils,
       washed, dried, and stripped from the glass.
IC   C23B; C23C
CC   9 (Electric and Magnetic Phenomena)
IT   **Memory devices**
          (copper foil substrate for **magnetic**)

AN   1962:427404 HCAPLUS Full-text
DN   57:27404
OREF 57:5463d-f,5464a
TI   Magnetic film elements
PA   International Business Machines Corp.
SO   4 pp.
      PATENT NO.   KIND DATE   APPLICATION NO. DATE
      ---------------   ---- --------   --------------- --------
PI   GB 888762   19620207   GB   <--
PRAI US   19581118 <--

AB   By application of a magnetic field, it is possible to reverse directions of
      magnetization by either a rotational coercive force or a wall-motion coercive
      force. By making a thin film, the more rapid rotational coercive force is
      enhanced at the expense of the output signal. By using a series of closely
      spaced parallel serrations on a substrate and depositing a magnetic film of
      uniform thickness on it, it is possible to control the direction of
      magnetization. The direction of magnetization is parallel to the serrations.
      The magnitude of the coercive force varies with the dimensions of the grooves,
      making it possible to obtain a wide range of magnetic properties. Cu can be used
      as substrate with grooves caused by abrasives such as Abrasive Paper 320. A thin
      magnetic film of 80% Ni-20% Fe is deposited by methods, such as vacuum
      evaporation or electrodeposition, giving a uniform thickness of 2000-10,000 A.
      For a given amount of metal, the film thickness is less than that for a **flat**
      film, giving a high rotational coercive force and a high signal output. The
      serrations have a **peak**-to-valley height of .apprx.8 μ, a **peak** -to-**peak** distance
      of 48 μ, and a lateral **peak** -to-valley distance of 25 μ. The magnetic film
      element is electroplated on the Cu.
CC   9 (Electric and Magnetic Phenomena)
IT   **Memory devices**
         (films for, with controlled **magnetization** direction)

AN   1985:603430   HCAPLUS Full-text
DN   103:203430
TI   Polishing technique for gadolinium gallium garnet
AU   Raether, Robert G.; Prochnow, Eberhard R.
CS   Lawrence Livermore Natl. Lab., Livermore, CA, 94550, USA
SO   Applied Optics (1985), 24(21), 3420
       CODEN: APOPAI; ISSN: 0003-6935
AB   Polishing of Gd Ga garnet to obtain high damage level laser surfaces was achieved
       in 3 steps using: (1) a 7% mixture of 3-μm diamond powder in ethylene glycol
       applied with a dropping pipet; (2) a 7% mixture of 1-μm diamond powder in
       ethylene glycol; and (3) Nyacol colloidal silica, grade C-58 (50-mμm grit size)
       diluted 2:1 with distilled water. After polishing the surface smoothness was
       1.6-3.3-Å rms with a slope of 8-14 Å **peak**-to-valley. The **flatness** was λ/10 or
       better at 6328 Å over the entire surface.
CC   73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
       Properties)
IT   **Memory devices**
          (**magnetic** bubble, polishing technique for gadolinium gallium
          garnet for)